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Adaptation in human settlements: key findings and way forward

Report by the secretariat

Summary

Adapting to climate change in human settlements is critical to ensuring that human development is not jeopardized and that the world's growing population has the opportunity to thrive where they live. This report shares key findings, good practices and lessons learned on adaptation in human settlements and is based on submissions from Parties and organizations and expert knowledge of the latest experience and research. It provides evidence of, and guidance and tools for, the coordinated local engagement of national and subnational governments in building climate resilience in collaboration with communities, civil society organizations, research centres and the private sector.

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I. Synopsis

1. Assessing sensitivity and vulnerability to climate change

1. Climate change is exacerbating the vulnerability of human settlements to natural and human-made hazards globally, especially in developing countries, coastal and delta regions and small island developing States (SIDS).

2. Vulnerability is a function of a population's sensitivity to climate impacts and its adaptive capacity. Vulnerability varies among groups (it is high, for example, for infants, the elderly, injured and disabled people and marginalized groups), and geographically – across the globe, regions and even single settlements.

3. Assessments of human settlements should take into account location-specific economic, social, environmental, political and cultural drivers of vulnerability. Gender-disaggregated data on vulnerability should be collected locally to better identify and address root causes of gender-differentiated vulnerability.

4. Numerous vulnerability assessment and adaptation planning toolkits, covering settlements from cities to villages and informal settlements, are available for use by national and local governments. Some toolkits target those lacking resources or adaptation planning experience.

5. Inclusive assessment and participatory planning processes can foster local ownership and facilitate designing and implementing adaptation action. Local-level adaptation planning processes should involve women and residents of informal settlements alongside civil society organizations (CSOs), researchers and the private sector. Robust adaptation planning should consider indigenous and traditional knowledge and conventional scientific knowledge.

2. Integrating short- and long-term climate considerations into adaptation planning

6. Integrating short- and long-term climate considerations into adaptation planning can help avoid maladaptation, minimize climate-related loss and damage and build long-term adaptive capacity.

7. Adopting a long-term view of adaptation should include developing land-use plans to manage geographical expansion of human activities. Natural resources and ecosystems such as wetlands and forests can act as a buffer in the case of extreme weather events and should be conserved. Regionally integrated planning approaches help to avoid city-level adaptation inadvertently increasing the vulnerability of neighbouring settlements. Food security concerns can lead to the promotion of urban and peri-urban agriculture, which can foster city greening and adaptation planning.

8. Ecosystem-based adaptation provides one solution. It has a long-term focus, brings numerous co-benefits and can be combined with engineering-based solutions. However, integrating long-term considerations into planning requires thinking beyond infrastructure solutions and focusing on systemic changes, including individual, community and organizational behavioural ones.

9. Adaptation must be a dynamic, open-ended and iterative process. Visualizing a range of adaptation actions ahead of time can be useful in providing decision makers with new options as circumstances change.

10. Resettlement of communities should be a 'last resort' consideration: sufficient safeguards are needed to ensure the vulnerability of displaced populations is not increased in other ways. Conversely, planning for the upgrading of informal settlements can efficiently address the current and future impacts of extreme and slow onset events.

3. Role of national governments in supporting local-level adaptation

11. National governments should emphasize human settlements in national adaptation strategies, including national adaptation plans (NAPs), link national and local adaptation

planning, and support the role of local governments in planning and implementing adaptation in human settlements.

12. National governments are responsible for creating an enabling policy, legal and regulatory environment so that subnational governments have the mandate and resources to develop and implement adaptation plans. This may require devolving adequate powers, including through effective decentralization, and ensuring that local governments have sufficient capacity.

13. Providing subnational governments with access to financial resources involves reliable and sufficient fiscal transfers and permitting local authorities to collect taxes, fees or charges and/or to develop innovative financing mechanisms. International technical and financial support for adaptation in human settlements needs to be more widely available and accessible, including to subnational governments.

14. National governments play a crucial role in supporting the production of reliable data, as well as in education, capacity-building and research. Supporting local universities and research centres can facilitate the work of 'mediators' (i.e. research centres or multi-stakeholder groups) that provide actionable information and support on adaptation and resilience to local policy and decision makers.

15. National governments should support the strategic integration of adaptation policy and action across all levels of governance. Such multilevel governance should include national and subnational governments as well as local communities and entail clearly defined responsibilities for the actors at each level.

4. City-to-city partnerships

16. City-to-city partnerships, including through city networks, have helped partners improve their understanding of climate risks and adaptation methods and can accelerate the pace of innovation and implementation. City networks generally seek to connect urban centres that face similar circumstances and/or risks so that they can benefit from a 'shared learning' process.

17. There are numerous local government networks and multi-stakeholder networks that focus primarily on urban resilience, as well as sector-specific networks that facilitate peer-to-peer support or mentoring in areas such as food security and provision of water. However, more South–South city networks are needed.

18. Challenges associated with maintaining city-to-city partnerships include (1) capacity issues (too few and high turnover of staff), (2) the political–technical disconnect (political cycles and the needs of those involved in technical partnerships are mismatched) and (3) insufficient emphasis on monitoring and evaluation.

5. Next steps with partners

19. At the technical dialogue and the 11th Focal Point Forum under the Nairobi work programme on impacts, vulnerability and adaptation to climate change (NWP), both on human settlements and adaptation, various response actions were identified.[1]

20. The United Nations Human Settlements Programme (UN-Habitat) expressed interest in coordinating with relevant organizations and experts on the drafting of supplementary guidance materials to strengthen the consideration of human settlements in national adaptation planning and implementation processes. ICLEI – Local Governments for Sustainability (ICLEI) expressed interest in supporting the development of new South–South city-to-city partnerships by capitalizing on existing initiatives and in further supporting the monitoring and evaluation of local adaptation action.

21. National Governments and the international community were invited to support the capacity-strengthening of public sector staff and researchers and to facilitate the access of subnational governments and other relevant local actors to adaptation finance.

[1] See annex I for the proceedings of the technical dialogue and annex II for the proceedings of the Focal Point Forum.

22. The secretariat was invited to identify the specific knowledge needs of national and subnational decision makers, as well as of developers of adaptation plans (including NAPs), to help align the supply of and demand for knowledge of adaptation in human settlements, in the context of the NWP.

II. Background

A. Importance of human settlements to climate change adaptation

23. Urban population is expected to grow by 2.5 billion by 2050 and over 90 per cent of this growth will take place in Africa, Asia and Latin America and the Caribbean.[2] According to the New Urban Agenda, the world's urban centres (especially in developing countries) are already vulnerable to the adverse impacts of climate change and other natural and human-made hazards, particularly in coastal areas, delta regions and SIDS.[3]

24. In response to this growing vulnerability, climate-resilient development in villages, towns and cities of all sizes is crucial to adapting to climate change. Numerous initiatives from global to community level are already under way to address the adaptation[4] challenge in urban and rural (including remote) human settlements.[5] While some initiatives are specific to adaptation, others are part of a broader resilience[6] or sustainable development agenda.

25. Adaptation actions in human settlements range from nature-based to infrastructure-based measures. Nature-based measures include vegetal cover expansion, coastal resource management and ecosystem protection. Infrastructure-based measures comprise 'climate proofing' infrastructure, including storm drainage systems, water supply and treatment plants, and protecting or relocating energy or solid waste management facilities. Some coastal cities may also need to plan for infrastructure development, protection and/or relocation related to sea level rise.[7] But adaptation is more than physical 'climate proofing'; it is a dynamic, iterative, cross-sectoral and open-ended planning and implementation process that requires political, institutional and financial support, as well as behavioural change.

26. Human settlements are generally managed by municipal authorities or local governments. The role of local governing bodies and the importance of local-level action for climate resilience are recognized in the 2030 Agenda for Sustainable Development,[8] the Sendai Framework for Disaster Risk Reduction 2015–2030,[9] the Paris Agreement[10] and the

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[2] See https://www.unhabitat.org/about-us/un-habitat-at-a-glance/.

[3] See paragraph 64 (and paras. 63 and 65–80) of the New Urban Agenda, available at http://www.habitat3.org/wp-content/uploads/NUA-English.pdf.

[4] Adaptation is defined in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (AR5) as "the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects" (see http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-AnnexII_FINAL.pdf).

[5] According to the Vancouver Declaration on Human Settlements, human settlements can be defined as the totality of the human community – whether city, town or village – with all the social, material, organizational, spiritual and cultural elements that sustain it (see https://www.unhabitat.org/the-vancouver-declaration-on-human-settlements-from-the-report-of-habitat-united-nations-conference-on-human-settlements-vancouver-canada-31-may-to-11-june-1976/).

[6] Resilience is defined in the AR5 as "the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation" (see http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf, page 5).

[7] See https://www.unhabitat.org/urban-themes/climate-change/.

[8] See paragraphs 34, 45 and 52 of the 2030 Agenda for Sustainable Development, available at http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

[9] See http://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf, paragraphs 8, 18(e), 19(c) and (f) and 20.

[10] See Article 7, paragraph 2, of the Paris Agreement, available at

New Urban Agenda.[11] Many regional and local governments, for example that of eThekwini, South Africa,[12] have been adaptation pioneers and continue to innovate on climate resilience and sustainable development, with or without support from their national governments.

27. In this report, following a summary of key findings in chapter I and the provision of definitions, NWP mandates and an overview of the submissions on human settlements and adaptation in chapter II, chapter III provides a more detailed account of the key findings from NWP activities on human settlements and adaptation as well as possible response actions to be undertaken. Chapter IV concludes with next steps to be considered at the forty-eighth session of the Subsidiary Body for Scientific and Technological Advice (SBSTA).

B. Knowledge-for-action mandates of the Nairobi work programme

28. SBSTA 44 requested the secretariat, under the NWP, to synthesize existing knowledge on human settlements and adaptation in the following areas: (1) assessing sensitivity and vulnerability to climate change; (2) integrating short- and long-term climate considerations (including extreme and slow onset events) into adaptation planning; (3) the role of national governments in supporting local-level adaptation; (4) city-to-city partnerships on climate change; and (5) cross-cutting issues and linkages to the process to formulate and implement NAPs. Submissions were invited from Parties and relevant organizations to form the basis of the synthesis report, which was also to cover the outcomes of the 11th Focal Point Forum, on human settlements and adaptation, held during the twenty-third session of the Conference of the Parties (COP).[13] SBSTA 46 requested the secretariat to enhance the engagement of experts and expert organizations, including those of developing countries, in the Focal Point Forum and complementary co-organized events.[14] As illustrated in the figure below, a stepwise approach was implemented to achieve those objectives through the mandated activities on human settlements and adaptation.

Seven-step approach of the Nairobi work programme to maximizing knowledge support provided to Parties and stakeholder engagement

Abbreviation: COP = Conference of the Parties.

http://www.unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.

[11] See http://www.habitat3.org/wp-content/uploads/New-Urban-Agenda-GA-Adopted-68th-Plenary-N1646655-E.pdf, paragraphs 15(b), 21, 29, 79 and 81.

[12] See the Durban Adaptation Charter at http://www.durbanadaptationcharter.org/.

[13] FCCC/SBSTA/2016/2, paragraph 15(b).

[14] FCCC/SBSTA/2017/4, paragraphs 21, 23, 24 and 26.

29. Activities on human settlements and adaptation under the NWP have helped reinforce linkages with global frameworks such as the 2030 Agenda for Sustainable Development (as mandated at SBSTA 44, 45 and 46),[15] including United Nations Sustainable Development Goals 9 and 11,[16] and contributed to the international debate, including through joint events with the Urban Climate Change Research Network[17] and ICLEI[18] at Habitat III,[19] and during the Resilient Cities 2016 and 2017[20] forums.

30. This report was prepared in collaboration with expert organizations. The submissions[21] and exchanges with experts, representatives of Parties and NWP partner organizations and other relevant organizations at the technical dialogue and the 11th Focal Point Forum addressed adaptation opportunities and challenges related to coastal, rural, remote and urban settlements, including in the least developed countries (LDCs) and SIDS.[22] The report indicates next steps, including possible actions that NWP partner organizations are willing to undertake, or that should be undertaken by other stakeholders, to address the challenges identified.

III. Key findings

A. Assessing vulnerability and integrating short- and long-term climate considerations into adaptation planning

1. Understanding vulnerability of human settlements to climate change

31. The Intergovernmental Panel on Climate Change (IPCC) defines sensitivity as a component of vulnerability.[23] Sensitivity is the degree to which a system responds, either adversely or beneficially, to climate-related stimuli. Vulnerability is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.[24] Drivers of vulnerability include migration, poor governance, urban densification, sprawl on risky land, and reliance on urban infrastructure or on subsistence farming, while structural factors can relate to age, health status, place of residence or gender.

32. **The social groups that tend to be the most vulnerable to climate change are infants, the elderly, those with diseases, injuries or disabilities and marginalized groups, such as those living in informal settlements.**[25] Twenty-five per cent of the world's urban population lives in slums,[26] which are the most deprived and excluded form

[15] See http://www.unfccc.int/adaptation/workstreams/nairobi_work_programme/items/7557.php.

[16] See document FCCC/SBSTA/2017/INF.6, chapter II.F.

[17] See http://www.uccrn.org/.

[18] See http://www.iclei.org/.

[19] See http://www4.unfccc.int/sites/NWP/News/Pages/Joint-Network-Event-Catalyzing-climate-change-adaptation-in-cities-through-knowledge.aspx.

[20] See http://www4.unfccc.int/sites/NWP/News/Pages/ICLEI-resilient-cities-2017.aspx.

[21] See annex III for a list of submissions, annex IV for an overview of the submissions and annex V for a list of tools identified in the submissions.

[22] In line with document FCCC/SBSTA/2017/4, paragraph 25.

[23] See https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_Glossary.pdf.

[24] See https://www.ipcc.ch/ipccreports/tar/vol4/english/pdf/annex.pdf.

[25] Informal settlements are residential areas where: (1) inhabitants have no security of tenure vis-a-vis the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing; (2) the neighbourhoods usually lack, or are cut off from, basic services and city infrastructure and (3) the housing may not comply with current planning and building regulations and is often situated in geographically and environmentally hazardous areas. In addition, informal settlements can be a form of real estate speculation for all income levels of urban residents, both affluent and poor (see https://www.unhabitat.org/wp-content/uploads/2015/04/Habitat-III-Issue-Paper-22_Informal-Settlements.pdf).

[26] Slums are the most deprived and excluded form of informal settlements, characterized by poverty and large agglomerations of dilapidated housing often located on the most hazardous urban land. In addition to tenure insecurity, slum dwellers lack a formal supply of basic infrastructure and services.

of informal settlements. Slum populations equate to 61 per cent of the urban population in Africa, 30 per cent in Asia and 24 per cent in Latin America and the Caribbean.[27] Informal settlements in coastal or littoral areas[28] are generally the most exposed[29] to climate change impacts. Moreover, there are gender differentials in vulnerability, owing to differences in gender roles and power relations and also to the different reproductive systems of women and men. In most cases, women's vulnerability is higher than men's. Gendered vulnerabilities intersect with other characteristics of disadvantaged groups, often aggravating vulnerabilities. However, patterns of vulnerability vary significantly across settlements, in both high- and low-income countries.

33. **Vulnerability indices should consider three aspects of vulnerability: exposure to impacts of climate and environmental change; socioenvironmental sensitivity of the affected population; and capability of the population or system to adapt to the impacts**. The methodological implications of these three aspects are as follows:

(a) Vulnerability assessments need to jointly consider the cultural, social, economic and environmental features of settlements and their ecosystem services, as opposed to in isolation;

(b) Vulnerability assessments should draw from multiple disciplines and rely on many methods, which can include mixed data collection methods such as structured household surveys, participatory community focus group discussions and in-depth life history interviews;

(c) Fine-grained and locally focused social vulnerability assessments facilitate spatial analyses of vulnerability;

(d) Gender-disaggregated data on vulnerability, including sensitivity to climate change, are needed to identify the causes of gender-differentiated vulnerability. Response measures will depend on the causes identified.

34. **Numerous toolkits and guides are freely available to support national and local governments in developing their own vulnerability assessment approach as part of their planning processes**. Such toolkits and guides include the UN-Habitat "Planning for Climate Change" guide and toolkit,[30] which supports cities in comprehensively assessing their vulnerabilities related to extreme weather and slow onset events.

35. Other tools, toolkits and guides specifically address:

(a) **Regional contexts**: the ICLEI "Pacific Islands Urban Resilience" toolkit[31] incorporates climate resilience, low-emission development and disaster risk reduction;

(b) **Coastal areas**: such as the UN-Habitat "Tool for coastal and small island state water utilities to assess and manage climate change risk";[32]

(c) **Small to intermediate-sized cities or urban districts of bigger cities, including informal settlements**: the UN-Habitat "City Resilience Action Planning" tool (CityRAP tool)[33] has been implemented in 25 cities in nine countries in sub-Saharan Africa.

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public space and green areas, and are constantly exposed to eviction, disease and violence (see https://www.unhabitat.org/wp-content/uploads/2015/04/Habitat-III-Issue-Paper-22_Informal-Settlements.pdf).

[27] See https://www.unhabitat.org/wp-content/uploads/2015/04/Habitat-III-Issue-Paper-22_Informal-Settlements.pdf.

[28] See http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap9_FINAL.pdf.

[29] In the AR5, exposure is defined as "the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected" (see http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-AnnexII_FINAL.pdf).

[30] Available at https://www.unhabitat.org/books/planning-for-climate-change-toolkit/.

[31] Available at https://pacific.oceania.iclei.org/wp-content/uploads/2017/01/PIUR-10Apr2017.pdf.

[32] Available at https://www.climatelinks.org/resources/tool-coastal-and-small-island-state-water-utilities-assess-and-manage-climate-change-risk.

[33] See http://www.dimsur.org/tools-2/.

The output of the tool is a City Resilience Framework for Action. Few resources are needed for planning: the tool relies on dedicated staff from the municipality and can be used in locations with high logistical constraints, low technical and institutional capacity and low-level literacy;

(d) **Rural settlements**: with the support of the Asia-Pacific Network for Global Change Research, a climate-focused rapid community resilience assessment toolkit[34] was developed for provincial and communal governments and non-governmental organizations. It has been tested in north-west Cambodia and central Viet Nam and provides a useful guide for those with limited expertise to gather information at low cost.

2. Vulnerability assessment and adaptation planning as an inclusive process

36. **An inclusive adaptation planning process is best suited to addressing the vulnerability of human settlements and building on local stakeholders' assets**[35] It should consider traditional and indigenous knowledge and conventional scientific knowledge.[36] Co-planning locally with civil society, the private sector and the research community can yield several benefits:

(a) Involving the insurance industry in risk and vulnerability assessments can equip cities with quality data, state-of-the-art tools, risk analytics and catastrophe models to avoid flawed assessments. In addition, engaging insurance companies can help foster the engagement of other private sector organizations that play a major part in the resilience of the local economy;

(b) Researchers from eight African cities involved in the Urban Africa: Risk Knowledge programme[37] have developed linkages with policy and practice in each location, thereby enhancing the ability of the city authorities to strengthen their climate change adaptation responses.

37. **A gender-sensitive assessment and planning process is critical to addressing the observed higher vulnerability of women and girls and gender differences in terms of adaptation opportunities and capacity**. A gender-sensitive approach can also ensure that women are not just considered a vulnerable group but are offered the opportunity to become agents of change through gender-transformative responses to climate change.[38] The guidance document *Gender and Urban Climate Policy* developed by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), GenderCC – Women for Climate Justice and UN-Habitat suggests principles and priorities for gender-sensitive climate policies in urban areas and includes a six-step process for integrating gender-sensitive approaches into planning.[39] Recently, the City Council of Kampala, supported by the UN-Habitat Cities and Climate Change Initiative, implemented the six-step process and produced a draft gender policy.[40]

38. **Residents of low-income, informal or marginalized settlements should participate in assessment and planning processes**. They have generally acquired extensive experience of dealing with climate variability and consequently have invaluable knowledge about the impacts that disasters have on their settlements and community

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[34] See http://www.apn-gcr.org/2017/09/01/community-resilience-tool-identifies-adaptation-options-for-communities-in-cambodia-and-viet-nam/.

[35] See http://www.unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/906.pdf.

[36] See http://www4.unfccc.int/Submissions/Lists/OSPSubmissionUpload/754_269_131505233001330712-Vanuatu_SBSTA%20Submission_Human%20settlements.pdf.

[37] See https://www.urbanark.org/about-us.

[38] See http://pubs.iied.org/10784IIED/.

[39] Available at http://www.gendercc.net/fileadmin/inhalte/dokumente/8_Resources/Publications/Guidebook_Gender_and_Urban_Climate_Policy_June_2015.pdf.

[40] See https://www.unhabitat.org/urban-initiatives/initiatives-programmes/cities-and-climate-change-initiative/.

characteristics and about various coping strategies. The participation of these groups can be supported in various ways:

(a) **Consultation and direct collaboration with communities** within the framework of participatory climate adaptation appraisals, participatory vulnerability analysis and/or participatory risk mapping:

(i) The ICLEI "Resilient Africa Interactive Adaptation Participatory Process" tool[41] is an online decision-support tool that assists African local governments to create an adaptation strategy and improve local adaptive capacity through a customizable participatory process;

(ii) As an example of participatory vulnerability assessment, UN-Habitat successfully collaborated with communities in 189 villages of the Lao People's Democratic Republic using secondary data and open-source software to generate primary data in a low-cost and efficient manner;

(iii) Moreover, in Honiara, UN-Habitat supported community-based adaptation in three highly vulnerable informal communities by training local officials, community representatives and partners in the use of tablets, drones and geographic information systems to prepare climate impact exposure maps of the communities;

(b) **Working with community organizations**, such as the Homeless Peoples Federation in the Philippines or CSOs in the Caribbean. Such organizations can undertake community profiles, enumeration activities and community-led research. Bottom-up assessment and planning processes foster greater ownership of adaptation plans by local and national governments, thereby facilitating the implementation of action, provided that roles and responsibilities have been clearly defined and that funding is available. Sufficient time should be allowed to integrate local communities into the planning process and to build trust to allow for the successful implementation of adaptation measures. For example, following the participatory planning process with the CityRAP tool in Chowke, Mozambique, the local government and communities took the immediate initiative of clearing drainage and building public spaces.

3. Integrating short- and long-term climate considerations into adaptation planning

39. **The benefits of integrating short- and long-term climate considerations into adaptation planning are**:

(a) **Avoiding maladaptation** (i.e. implementing measures to adapt to one threat that increase the exposure of the economy, society and environment to other shocks). Long-term consideration is particularly crucial for infrastructure projects given that some infrastructure has a 10- to 50-year lifetime and can also strongly influence the location of formal and informal urban expansion. It is important to avoid increasing the short- and long-term vulnerability of neighbouring peri-urban or rural settlements when implementing adaptation action to decrease the vulnerability of cities. This justifies adopting a metropolitan, regionally integrated and/or watershed-oriented approach, which may be transboundary in nature;

(b) **Moving beyond strengthening coping capacities to building long-term adaptive capacity**. In addition to improving their disaster preparedness by strengthening the disaster management offices, governments can revise their long-term land-use plans to incorporate responses to sea level rise and/or drought. In Tacloban, the Philippines, the Tacloban Recovery and Sustainable Development Group was established to mainstream climate resilience considerations in the city's 10-year comprehensive land-use plan;

(c) **Minimizing loss and damage associated with the impacts of climate change**. Developing a mechanism to assess, avert, minimize and redress loss and damage is a priority area for Vanuatu. Minimizing loss and damage was also an important objective of the adaptation planning process for Belo Horizonte, Brazil, as it will contribute to optimizing investment in infrastructure.

[41] See http://www.resilientafrica.org/page.php?ID=100.

40. **However, many local governments continue to approach development with a short-term focus**, such as building on floodplains to maximize short-term economic gains, or addressing climate change related impacts only after they have occurred. Political cycles can drive short-term perspectives and hinder planning for slow onset events. This raises the issue of grounding political legitimacy over longer time frames. The imbalance of power between large private companies and local governments in the global South is seen as a barrier to effective adaptation planning and implementation. Conversely, multilevel governance systems, favouring the integration of strategies and actions from national to local level, may facilitate the adoption and implementation of more stable long-term policies.

41. **Integrating long-term climate considerations into adaptation planning involves managing the geographical expansion of human activities** (e.g. urban development or agriculture activities) **to conserve natural resources** such as wetlands and forests. Protecting 'green and blue infrastructure'[42] through land-use planning can improve the water cycle, buffer against extreme weather events and have numerous other co-benefits, including carbon sequestration, biodiversity conservation and positive health-related outcomes:

(a) In Ecuador, the provincial government of Azuay identified limiting agricultural expansion in fragile natural zones such as *páramo* original forests and natural protected areas as one of its main adaptation challenges;

(b) In Yaoundé a project funded by the Global Environment Facility is under way to fight the deforestation and degradation of peri-urban forested areas through training on new carbonization techniques in three villages.

42. **Both conventional engineering approaches and ecosystem-based approaches,[43] including hybrid approaches, should be considered to address local challenges and integrate long-term climate considerations into adaptation planning**. Some ecosystem-based adaptation measures may take longer to yield positive benefits than engineering solutions, but they have numerous co-benefits and can be combined with engineering solutions. However, issues of justice and equity must be considered in relation to urban greening to ensure broader sustainable development objectives are met. Some examples of ecosystem-based adaptation measures include the following:

(a) Glasgow, the United Kingdom of Great Britain and Northern Ireland, is managing its water flows by combining traditional infrastructure (building reservoirs and flood defence walls) with ecosystem-based adaptation through the restoration of 22 acres of wetlands. These actions have protected 7,200 homes via a flood damage reduction system, saving EUR 13 million in 2011–2012 alone;

(b) In West Africa, the Food and Agriculture Organization of the United Nations has promoted microgarden technologies as climate-smart food solutions to alleviate malnutrition and poverty resulting from the rapid growth of the urban population. The 'growing greener cities' approach[44] through the development of urban and peri-urban agriculture in central Africa contributes to increasing vegetal cover, while also addressing food security issues. Floodplains and riverbanks can be ideal locations for urban gardening, because establishing gardens can reduce encroachments, while supporting the local economy and food security. Peri-urban and urban (rooftop) gardens can also provide livelihoods, including for women, and community spaces and have proved to be catalysts for adaptation action in cities.

43. **Integrating long-term climate considerations into adaptation planning requires thinking beyond nature-based, engineering and hybrid infrastructure solutions and encouraging behavioural change at the personal, organizational and community level**.

[42] See http://www.ec.europa.eu/environment/nature/ecosystems/index_en.htm for the European Commission's definition.

[43] See document FCCC/SBSTA/2017/3 for definitions of ecosystem-based adaptation and further information on the approach.

[44] See http://www.fao.org/ag/agp/greenercities/.

This can be done for example by shifting from traditional urban design and planning approaches towards urban transition management and process-design approaches,[45] which may be better able to guide the transformative processes required to address climate change challenges.

44. **Adaptation needs to be an iterative, cross-sectoral and open-ended planning and implementation process**. Some methods are available to support long-term decision-making on adaptation, including the 'adaptation pathways' approach, whereby decision makers (and possibly communities) visualize a range of possible adaptation actions in response to sudden and slow onset events and determine the potential timescales (decision lifetimes) for their implementation. This provides new advanced options for decision makers to choose from when circumstances change:

(a) The experience of the Alliance for Global Water Adaptation, through its "Collaborative Risk Informed Decision Analysis" tool,[46] suggests that adaptation pathways can help planners avoid 'locking in' to a single strategy for investments and infrastructure with long lifetimes by making staged decision plans. The costs and benefits of each option should be analysed, thus supporting better-informed decision-making when certain 'tipping points' are reached. Choices on different pathways depend on stakeholder preference and the availability of resources;

(b) The Indian Institute for Human Settlements shared its experience of 'transformative scenario planning' for water management, which involves bringing together multiple stakeholders to discuss and envision future trajectories that cities can take, keeping in mind the evolving local and regional contexts.

45. **Resettlement of communities should be considered as a 'last resort', and if carried out involve a participatory process and sufficient safeguards so as not to increase the vulnerability of the displaced population in other ways** (e.g. hampering their access to the workplace or breaking up existing social networks and community groups). Relocation of human settlements in response to adverse climate impacts was addressed in only one submission, in relation to low-income, marginalized population groups located in the most exposed areas (e.g. riverbanks and hillsides). Conversely, upgrading informal settlements can be considered an efficient way of integrating long-term climate considerations into adaptation planning.

B. Role of national governments in supporting local adaptation, including through national adaptation plans

46. Key adaptation activities will often be most effective at the household, neighbourhood, town or city scale. However, managing the territory of cities, towns or villages is the joint responsibility of subnational and national governments, while the adaptive capacities of any population are influenced by national (and/or provincial) policies related to economic development, health care, education and other social services. The efforts of national governments to avert, minimize and address loss and damage resulting from slow onset events have a significant local impact. Therefore, **effective scaling-up of climate action within countries must include an emphasis on human settlements in national adaptation strategies, linking local and national planning, and national government support for local adaptation**.

1. Acknowledging the importance of climate resilience of human settlements

47. UN-Habitat reported that 113 of 164 nationally determined contributions submitted by national governments had an urban focus. Most included climate change adaptation measures (75 of 113) to respond to generic adaptation issues, prominently food security, biodiversity and ecosystem conservation, water management and disaster vulnerability.[47]

[45] See http://www.tdx.cat/handle/10803/336675.
[46] See http://agwaguide.org/about/CRIDA/.
[47] See https://www.unhabitat.org/books/sustainable-urbanization-in-the-paris-agreement/.

Those figures highlight the recognition of the importance of adaptation for human settlements. To help launch or sustain local adaptation action, it is important that human settlements be prioritized in national adaptation planning processes, frameworks or strategies. NAPs should consider human settlements, as in the case of Thailand's NAP, which is to be released at the end of 2018 and of which a key priority area is human settlements and security. Although some recommendations on integrating urban issues and climate change into national policies are included in some UN-Habitat policy notes,[48] more guidance may be needed for countries on how to consider human settlements in NAPs.

2. Supporting the leadership role of subnational governments

(a) Giving an official adaptation mandate to local governments

48. National governments should give local governments a mandate to develop climate change adaptation action plans and that mandate should be accompanied by sufficient funding. For instance, the Philippine Climate Change Act of 2009 recognizes that "the local government units are the frontline agencies in the formulation, planning and implementation of climate change action plans in their respective areas" and that "it is the responsibility of the national government to extend technical and financial assistance to local government units for the accomplishment of their local climate change action plans".[49] The mandate could be for local governments to develop their own adaptation plans and to integrate adaptation into their statutory plans. Such a mandate would facilitate the scaling-up of local climate action, provided that sufficient quality standards are met.

(b) Devolving sufficient powers and resources

49. **National governments are responsible for creating enabling policy, legal and regulatory frameworks for local governments to develop and implement adaptation plans**. Depending on nationally specific governance frameworks and circumstances, this may entail devolution of adequate powers, including through effective decentralization. Ill-defined or partially implemented decentralization laws and regulations lead to overlapping local and national rules and regulations and inadequate local human and financial resources.

50. Cities, towns and regions can struggle to mobilize funding for adaptation and many communities have to rely on local savings groups to cope with disasters. Providing access to financial resources at the local level involves **reliable and sufficient fiscal transfers as well as permitting local authorities to collect taxes, fees or charges and/or to develop innovative financing mechanisms such as green bonds**. It could also involve setting up a national adaptation fund that could be accessed by local entities through an application process. Some submissions mentioned programmes providing financial support, such as the Department for International Development programme Managing Climate Risks for Urban Poor in Asia,[50] and the European Union (EU) Global Climate Change Alliance+,[51] launched in 2014, which focuses on the LDCs and SIDS. However, such funding opportunities seem to be available mostly to national governments. Besides, when funding is available, it rarely targets capacity-building programmes, although enhanced capacity for disaster risk reduction, disaster preparedness and building resilience at all levels should be considered a 'no regrets' option. To facilitate access to funding, adaptation could be planned with funding opportunities in mind from the outset to increase the chances of action being taken.

51. **Different measures are needed to make technical and financial support for adaptation in human settlements more widely available and accessible, including to subnational governments**. Thailand suggested the establishment of a mechanism to create a triangular partnership between international organizations and national and subnational governments. Similarly, the Caribbean Natural Resources Institute (CANARI) invited

[48] See https://www.unhabitat.org/addressing-urban-issues-in-national-climate-change-policies-cities-and-climate-change-initiative-policy-note-3 and https://www.unhabitat.org/books/addressing-climate-change-in-national-urban-policy/.

[49] This information was provided in the submission of UN-Habitat.

[50] See https://www.devtracker.dfid.gov.uk/projects/GB-1-203842.

[51] See http://www.gcca.eu.

international donors to provide more resources for the capacity-building of CSOs, since building their core organizational competencies would improve the delivery of climate change adaptation programmes and projects (see paras. 62 and 63 below). ICLEI, which launched the Transformative Actions Program,[52] echoed the call for a global action framework for localizing climate finance. Lastly, Vanuatu called on the international community, and especially Parties included in Annex II to the Convention, to ensure the availability of adequate technical and financial support for adaptation initiatives, including through international and regional cooperation and mechanisms.

52. However, local government staff should have sufficient **capacity to ensure that the devolution of powers and resources leads to effective adaptation planning and implementation**. Local authority and resources are indispensable for accessing finance, including international adaptation finance.

(c) Facilitating multilevel governance of adaptation planning, including through national adaptation plans

53. In addition to horizontal integration, national governments need to support vertical integration of adaptation policy and action in a strategic manner. This includes coordination and collaboration between national and subnational governments in planning, implementing and monitoring adaptation action. **Vertical integration should not be understood as the replication of national plans at local level, but as facilitating multilevel governance and integrated planning**. Such multilevel governance should include national and subnational governments, as well as local communities, with a clear definition of responsibilities across all levels of government. It can help national governments to recognize the numerous adaptation initiatives that are already happening locally and could feed into the NAP process. Such multilevel governance can also facilitate the consideration of local climate action in nationally determined contributions.

54. **To strengthen synergy and coordination of climate change adaptation actions in human settlements, vertical integration between national and subnational governments needs to be continuously strengthened**. In the case of NAPs, as presented by the International Institute for Sustainable Development, vertical integration is a process of creating linkages between national and subnational adaptation planning, implementation and monitoring and evaluation. It requires ongoing efforts to ensure that local realities are reflected in the NAP process and relevant outputs, and that NAPs enable adaptation at the subnational level. The approach to vertical integration requires an explicit national commitment to an inclusive and participatory NAP process, with ongoing dialogue between national and subnational actors throughout all stages. Guidance is available to facilitate vertical integration in the NAP process. For instance, *Vertical Integration in National Adaptation Plan (NAP) Processes: A guidance note for linking national and sub-national adaptation*[53] provides a flexible approach that can be adapted to a country's context, capacities and available resources. Effective vertical integration requires:

(a) Powers to undertake local sectoral and development planning, including through effective decentralization, as appropriate;

(b) Institutional arrangements for coordination;

(c) Information-sharing;

(d) Sufficient capacity and capacity development to ensure that actors at different levels have the knowledge and skills to engage in the process.

55. **Vertical integration can translate into various forms of coordination and collaboration between national and local governments**:

(a) In Indonesia, in line with the National Climate Change Adaptation Plan and National Framework Strategy on Climate Change, the national Government works with

[52] See http://www.tap-potential.org/.

[53] Available at http://www.napglobalnetwork.org/wp-content/uploads/2016/11/Vertical-Integration-in-NAP-Processes-Guidance-Note.pdf.

local governments in formulating and implementing the comprehensive development plan and the comprehensive land use plan;

(b) In Solomon Islands, the Honiara Urban Resilience and Climate Action Plan, released in 2016, is a joint strategy of the Honiara City Council (including community-level stakeholders) and the Government. It brings together previously disconnected agendas and involves multilevel action that can be supported and owned by many different groups in the city.

56. **Vertical integration includes other subnational governments, such as those of provinces and regions**. Regional governments can develop regional adaptation plans to address adaptation challenges in human settlements and coordinate with local governments. For instance, the Basque Country in Spain is revising its land-use plan to include adaptation to climate change and will carry out a pilot project on the land-use plan of Bilbao and its surroundings.

57. **Supranational entities can also participate in and significantly contribute to vertical integration**. For example, the EU has a long history of supporting the vertical integration of national, regional and local adaptation action:

(a) The EU Urban Agenda agreed upon in 2016,[54] of which adaptation is one of the 12 priorities, and the recently launched Partnership on Climate Adaptation to empower local authorities in planning and undertaking climate-resilient actions, and for local authorities, member States, the European Commission and other EU organizations to work together;

(b) The EU also supports its member States in the case of transboundary issues by facilitating regional adaptation action through regional strategies. For instance, the Baltic Sea region has an adaptation strategy and action plan as a result of the Baltadapt flagship project.[55]

58. **National governments should also support the participation of civil society in local adaptation planning and action for effective multilevel governance**. Mechanisms for community participation and oversight to improve accountability, transparency and public buy-in could be expanded through participatory budgeting, monitoring and evaluation, citizen forums and scorecards, and e-governance through mobile platforms.

3. Strengthening the enabling environment for adaptation in the field of science, education and research

(a) Producing reliable data

59. A recurrent issue regarding vulnerability assessment is access to good-quality and reliable data, including:

(a) **Climate projections at a scale and level of accuracy that can be used with sufficient confidence for local land-use planning and control**. A consequence of lacking such data is that landowners and developers may threaten legal challenges against proposed restrictions on development that they see as based on insufficient scientific evidence. In fact, the experience of the Philippines shows that, even when the data are available, downscaled projections for flooding and storm surges at a given hotspot and for a given future year need to be confirmed by recently observed flooding and revision of the flood return periods;

(b) **Other economic, social and environmental data, which are usually available but not necessarily in the ideal format for a spatial or time-series analysis**. Collecting and analysing data for vulnerability assessments can be a time-consuming process. For vulnerability assessments to be effective, inefficiencies in collecting, storing and using data should be addressed.

60. **National governments play a crucial role in producing reliable meteorological information, climate projections and socioeconomic data**. Such data can be produced in

[54] Available at https://ec.europa.eu/futurium/en/urban-agenda.

[55] See http://www.baltadapt.eu.

collaboration with subnational or supranational entities. For instance, the Government of South Australia funded the development of an agreed set of climate change projections for south-eastern Australia. Some national governments have also taken steps to ensure the production, updating and availability of climate data for local action:

(a) The Indonesian Agency for Meteorology, Climatology and Geophysics developed a mechanism for the periodic revision and update of climate data for the formulation and projection of hazard levels. In addition, Indonesia's vulnerability index data and information system was developed to provide easily accessible information on vulnerability levels in certain areas or development sectors;

(b) The Australian Government funded the development of CoastAdapt,[56] an information delivery and decision-support framework containing information and guidance on climate change coastal impacts and responses. CoastAdapt also includes State-specific information on regulatory and legislative requirements and data availability.

61. While not specifically addressing the issue of climate projections, national governments can support the **participatory approaches** presented in chapter III.A.2 above in order to generate basic climate, economic, social and environmental data while also fostering the engagement of local stakeholders in adaptation action.

(b) Strengthening the technical capacity of local government staff and civil society organizations

62. Another major issue, particularly in developing countries, appears to be the insufficient capacity of local government staff and CSOs in relation to:

(a) **General understanding of climate change and its impacts**: local government staff, including more senior decision makers, would benefit from a better understanding of climate risks, which would help to counter a general hesitancy to enact adaptation plans. Ecosystem-based adaptation was specifically pointed out as an approach on which decision makers require training;

(b) **Data analysis, collection and management**: many local government staff appear to lack technical expertise for data collection, interpretation and usage. More training is needed, particularly in areas requiring advanced technical skills, such as using geographic information systems to represent climate risks, but also at the institutional level on general information and knowledge management practices and guidelines;

(c) **Scenario-building and iterative planning processes**: training on scenario-building, including normative and exploratory scenarios, would help local governments identify risks and vulnerabilities in the short, medium and long term. More longitudinal, temporally sensitive studies are also needed.

63. Examples of **activities addressing technical capacity deficits include**:

(a) The CANARI Climate ACTT project contributed to building the capacity of five CSOs in Trinidad and Tobago in two areas: organizational strengthening; and technical capacity to deliver projects and programmes for climate change adaptation and resilience;

(b) The Centre for Global Sustainability Studies in Malaysia, in collaboration with universities in Cambodia, the Lao People's Democratic Republic and Viet Nam and with the support of the Asia-Pacific Network for Global Climate Change Research, organized 'learning labs' on capacity-building for reducing loss and damage resulting from slow and rapid onset climatic extremes through risk reduction and proactive adaptation within the broader context of sustainable development;

(c) The national Government of the Philippines, with the support of UN-Habitat, has trained 380 coaches and trainers from government agencies and academia who are now mobilized as a technical support team for local governments as they plan for and act on climate change;

[56] See https://www.coastadapt.com.au.

(d) The submissions highlighted some courses currently available online, including UN-Habitat's education modules of the Cities and Climate Change Academy[57] and the Indian Institute for Human Settlements open online course on sustainable cities, which took place in 2017.[58]

64. **One solution to the deficit of local government staff technical capacity related to adaptation is working with an adaptation 'mediator'**, also referred to as an adaptation 'facilitator', 'translator' or 'promoter'. The mediator can be a representative of a CSO, university, research centre or multi-stakeholder working group. The role of the mediator is to deliver available data and information in a format that makes it actionable for local policymakers and practitioners. A mediator can thus help navigate information flows relating to adaptation, resilience and cities, and more importantly can tailor existing tools and approaches to the local context. By working closely with policymakers, the mediator can also help to include resilience approaches in local policy debates. The experience of the Future Resilience for African Cities and Lands project in Lusaka, Maputo and Windhoek highlights how 'city learning labs' can facilitate evidence-based decision-making for resilient development pathways.[59] Use of mediators can also decrease the reliance on international expertise for vulnerability assessments and planning, which is partly related to international funding requirements that often correlate with an adaptation focus on infrastructure.

(c) Supporting education and research

65. **Because of the need for data, knowledge and education on adaptation and resilience, national governments should support national research**, by, for example, funding public colleges, universities and/or research centres. Research conducted by such institutions will generate downscaled data and increase understanding of specific climate vulnerabilities. Social sciences have an important role to play in understanding resilience. National research could help produce locally relevant adaptation solutions, thus increasing climate resilience. Lastly, universities can act as the mediators referred to in paragraph 64 above. In the Philippines, the involvement and partnership of national agencies with State colleges and universities has provided support to local governments for undertaking assessments and for planning and prioritizing adaptation actions. The Philippine Climate Change Commission and Department of the Interior and Local Government are currently creating a programme to sustain the engagement of local academic institutions supporting local authorities in climate action planning and implementation.

C. City-to-city partnerships on adaptation to climate change

66. City-to-city partnerships, including through city networks, have helped to improve members' understanding of climate risks and adaptation methods and sustain their motivation for adaptation efforts. Peer-to-peer learning can accelerate the pace of innovation and implementation. Such networks generally seek to connect urban centres that face similar circumstances and risks so they can benefit from a 'shared learning' process. Networks can enable cities to move away from a solely technical approach and envision a more transformational approach encompassing the political structures and trade-offs that determine risk and vulnerability.[60] However, despite the benefits associated with city-to-city partnerships for resilience-building and adaptation, there are challenges as well. This section of the report describes current work on partnerships and networks among cities and the main challenges and opportunities moving forward. The local government networks[61]

[57] See https://www.unhabitat.org/urban-initiatives/initiatives-programmes/cities-and-climate-change-academy.

[58] See https://www.courses.sdgacademy.org/learn/sustainable-cities-october2016.

[59] See http://www.fractal.org.za.

[60] See http://pubs.iied.org/pdfs/10816IIED.pdf.

[61] Additional global and regional initiatives are listed in the annex to the document FCCC/SBSTA/2017/INF.3.

mentioned in the submissions and during the technical dialogue include numerous networks on climate change, which are listed in annex VI.

67. Community Actions and City-to-City Cooperation on Climate Change in the Philippines was reported as one example of a city-to-city partnership following the model of decentralized cooperation or municipal twinning between a city in the North and another in the South. The project engages Japanese and Filipino local government representatives. However, discussions during **the technical dialogue and the Focal Point Forum suggest that there are numerous North–South city twinning initiatives, including on adaptation**, such as the partnership between Bonn, Germany, and La Paz. Such partnerships between North and South also go beyond local governments and can be partnerships between research institutions or CSOs working specifically to address the adaptation challenge.

68. Several **global multi-stakeholder networks focusing specifically on cities and resilience to climate change impacts** were reported, as well as networks for specific sectors (e.g. water or food security) and networks for governments situated between the local and national level (see annex VI).

69. **An analysis of the submissions identified three main challenges in relation to city-to-city partnerships**, mostly related to insufficient funding in the South:

(a) Local governments often have **few staff and high staff turnover**, which can either limit or interrupt the partnership-building process;

(b) In the case of technical partnerships, **short funding cycles may prevent partnership-building** as only direct, regular and face-to-face interactions between personnel in partnering cities will ensure their continued engagement and interest;

(c) **The benefits and challenges of involvement in partnerships and networks are not adequately assessed**. It is important to regularly assess progress and whether cities themselves feel they are benefiting from the engagement and to highlight challenges and concerns to best identify response measures.

70. **There are not enough South–South partnerships and networks that support knowledge transfer between cities facing similar circumstances and constraints**. It is necessary to develop a toolbox that will specifically support this type of network across urban, rural, remote and coastal settlements.

IV. Next steps with partners

71. During the technical dialogue and the Focal Point Forum, participants discussed actions that could address the challenges identified. This led to some expressions of interest and open calls for collaboration.

72. UN-Habitat expressed interest in coordinating with relevant experts and organizations on the drafting of supplementary guidance materials to strengthen the consideration of human settlements in national adaptation planning and implementation processes, in collaboration with the Least Developed Countries Expert Group and partner organizations such as the Recycling Cities International Network. ICLEI expressed interest in supporting the development of new South–South city-to-city partnerships by capitalizing on existing initiatives, producing and disseminating information, including toolboxes for various types of settlement (e.g. rural and remote settlements), and in further supporting the monitoring and evaluation of local adaptation actions.

73. Additional local collaborative actions proposed by participants include:

(a) Strengthening collaboration between local government and private sector companies, including insurance companies;

(b) Strengthening collaboration between local government and universities or research centres to render data, information and knowledge on adaptation usable by practitioners, decision makers and community members;

(c) Strengthening collaboration between local government staff in charge of adaptation and those in charge of mitigation to ensure integrated planning;

(d) Engaging all stakeholders, including marginalized populations and indigenous knowledge holders, in vulnerability assessment and participatory scenario planning.

74. National governments and the international community were invited to support the capacity-strengthening of public sector staff and researchers, particularly in developing countries. Facilitating the access of subnational governments and other relevant local actors to adaptation finance was highlighted as essential.

75. The secretariat was invited to identify the specific knowledge needs of national and subnational decision makers and developers of adaptation plans (including NAPs) so as to help align the supply of and demand for knowledge of adaptation in human settlements in context of the NWP.

76. SBSTA 48 will be invited to consider next steps on the basis of this report and any follow-up actions.

Annex I

Proceedings of the technical dialogue on human settlements and adaptation

[English only]

1. A technical dialogue involving 11 international experts working on human settlements and adaptation, co-organized by ICLEI – Local Governments for Sustainability (ICLEI) and the United Nations Human Settlements Programme (UN-Habitat), under the auspices of the Nairobi work programme on impacts, vulnerability and adaptation to climate change (NWP), was held on 5 November 2017 at the ICLEI headquarters in Bonn. The purpose of the dialogue was to refine the key findings from the 24 submissions on human settlements and adaptation received by the secretariat, to prepare for the 11th NWP Focal Point Forum, on human settlements and adaptation, and to discuss future opportunities for collaboration. Discussions centred on the four mandated focus areas of the submissions, as detailed below.

2. The discussion first focused on conceptual differences between **assessing sensitivity and vulnerability to climate change**. Experts agreed to use the Intergovernmental Panel on Climate Change (IPCC) definition, which views sensitivity as a component of vulnerability. The challenges related to stereotyping women as either victims or agents of change were highlighted. Gender-differentiated vulnerability to climate change should be assessed and analysed in detail, acknowledging that it varies greatly within cities and across the globe. Understanding the structural factors of vulnerability to climate change in cities is also essential, such as informality, as well as reliance on network infrastructure and on cash for food and services. Informal settlements raise the issues of land-use control and addressing the challenges inherent to building on risky land. Experts underscored the importance of translating vulnerability assessments into climate action, including through long-term programmatic approaches.

3. On **integrating short- and long-term climate considerations (including extreme weather and slow onset events) into planning**, experts first highlighted the importance of planned growth of cities over the short, medium and long term. They emphasized that urban planning should be conducted with ecosystem boundaries in mind rather than focusing on a city's administrative boundaries. Experts also emphasized that attempting to limit urban growth has been proven to exacerbate vulnerability by driving the expansion of informal settlements. Previous efforts to evict and/or relocate informal settlements and slum dwellers have proven to carry heavy social and economic costs and thus relocation should only be considered as a 'last resort'. The importance of avoiding maladaptation (or false adaptation), including through short-term economic development, was stressed. Considering the circular economy, social cohesion and food systems as a part of city development, was suggested as a way to trigger long-term thinking and break down barriers between urban and rural development. The transformative or transformational adaptation approach has been widely discussed among IPCC scientists, although no consensus on the approach has yet been reached. It is currently referred to by policymakers to catalyse or justify a wide range of actions. As a concrete measure to limit development on floodplains, urban and peri-urban agriculture was presented as a solution that can enhance food security and contribute to women's empowerment by generating revenue. Analysing the behaviours of individuals or groups was seen as particularly important when planning for adaptation.

4. Regarding **the role of national governments in supporting adaptation locally**, experts underlined that subnational capacity and resources are a prerequisite for local governments to effectively address climate impacts, and that devolving powers to subnational governments should not be done without providing the technical and financial means to take action. For example, effective decentralization should grant local governments the powers to raise taxes and/or develop financial mechanisms such as climate or green bonds in order to finance their adaptation activities. Local adaptation plans should not merely replicate national adaptation plans (NAPs), but rather present the opportunity to build on the numerous actions already implemented locally, including by communities. Such local adaptation plans, particularly if they are mandated by the national government,

should meet minimum standards and form part of a multilevel governance of adaptation in which actions implemented by communities, subnational governments and the national government are coordinated and feed into one another. This raises the question of the consideration of human settlements, including cities, in NAPs, on which little guidance is currently available. National governments are seen as being responsible for building an enabling environment for local governments. This includes strengthening technical capacity for adaptation, including by training national and local government staff, policymakers and practitioners and developing climate change curricula for schools and universities, and supporting research on climate and resilience.

5. **City partnerships on adaptation** can be between governments, between research institutions or between civil society organizations. North–South partnerships between local governments are sometimes challenging because of differences in governance arrangements, physical circumstances and socioeconomic situations, but there are examples of successful North–South technical partnerships on adaptation, including between water utilities. Regarding communication between cities, online systems for facilitating networking among cities have demonstrated success in developed countries, but less in developing country settings. A major challenge for city networks is to continue collaboration once the original funding has been disbursed. Networks that have strong coordinating entities that provide information and develop tools and methodologies have proven to last longer than others. The association of local governments within national boundaries can facilitate the sharing of information and tools among cities and the organization of training.

6. Possible follow-up activities arising from the technical dialogue and the Focal Point Forum include communication on the key findings contained in the synthesis report on adaptation in human settlements at the World Urban Forum (7–13 February 2018, Kuala Lumpur), the IPCC Cities and Climate Change Science Conference (5–7 March 2018, Edmonton, Canada) and Resilient Cities 2018 (April 2018, Bonn).

7. UN-Habitat expressed interest in coordinating the drafting of supplementary guidelines on the consideration of human settlements in NAPs with relevant experts and organizations. ICLEI expressed interest in supporting the development of new South–South city-to-city partnerships by capitalizing on existing initiatives, and in further supporting the monitoring and evaluation of local adaptation action. National governments and the international community were invited to support the capacity-strengthening of public sector staff and researchers and to facilitate the access of subnational governments and other relevant local actors to adaptation finance. Further, the secretariat was invited to identify the specific knowledge needs of national and subnational decision makers, as well as of developers of adaptation plans (including NAPs), to help align the supply of and demand for knowledge of adaptation in human settlements in context of the NWP.

Experts participating in the technical dialogue

Expert	*Organization*
Ms. Ibidun Adelekan	University of Ibadan, Nigeria
Ms. Gotelind Alber	GenderCC – Women for Climate Justice, Germany
Mr. David Dodman	International Institute for Environment and Development, United Kingdom
Mr. Matthias Garschagen	United Nations University Institute for Environment and Human Security, Germany
Ms. Laura Kavanaugh	ICLEI headquarters, Germany
Mr. Robert Kehew	UN-Habitat, Kenya
Mr. Marcus Mayr	UN-Habitat, Kenya
Ms. Johanna Nalau	Griffith University, Climate Change Response Programme, Australia
Mr. Alfredo Redondo	C40 Cities, United Kingdom
Mr. Rahul Sengupta	United Nations Office for Disaster Risk Reduction, Germany
Mr. Nicola Tollin	United Nations Educational, Scientific and Cultural Organization Chair on Sustainability, Spain

Annex II

Proceedings of the 11th Focal Point Forum, on human settlements and adaptation

[English only]

1. The 11th Focal Point Forum under the Nairobi work programme on impacts, vulnerability and adaptation to climate change (NWP) **focused on human settlements and adaptation** and was held under the overall guidance of the Chair of the Subsidiary Body for Scientific and Technology Advice (SBSTA), Mr. Carlos Fuller, on 8 November 2017 in conjunction with SBSTA 47 and the twenty-third session of the Conference of the Parties.[1] The forum provided the opportunity for Party delegates, NWP partner organization focal points and other relevant human settlements experts to discuss the results of the submissions and emerging issues on human settlements and adaptation. Particular focus was placed on identifying actions to respond to identified gaps and needs in order to scale up adaptation action in human settlements.

2. **The SBSTA Rapporteur, on behalf of the SBSTA Chair**, presented the overall context and objective of the forum. He stated that it provided an excellent opportunity for policymakers, researchers, scientific communities and practitioners not just to exchange information on actions that they are engaged in, but also to identify areas for strategic collaboration in order to close critical gaps and inform adaptation action in human settlements.

3. In her keynote presentation, the **Deputy Executive Director of the United Nations Human Settlements Programme** provided an overview of the interlinkages between climate change and human settlements, citing examples of natural disasters and their implications for those living in human settlements. She noted that a high proportion of the populations and economic activities most vulnerable to climate change impacts are found in cities. As a final point, she reinforced the message that failing to address climate change impacts jeopardizes past human development progress, and that getting urbanization right will actively contribute to resilience-building and sustainable development. Following this, a youth representative provided some concrete examples of the options open to tropical cities in both high- and low-income countries to respond to climate-sensitive vector-borne diseases. A representative of the secretariat provided an overview of the key findings from the submissions on human settlements and adaptation.

4. Human settlements and adaptation experts facilitated four parallel focus group discussions, focusing on adaptation challenges in human settlements and current efforts and future opportunities to address them. At the end of the focus group discussions, designated rapporteurs summarized them in plenary:[2]

(a) **Group one discussed assessing sensitivity and vulnerability to climate change**. It identified small-scale spatial variations in vulnerability and variations in vulnerability over time as assessment challenges. Limited data collection and analysis skills within communities and the need for effective cross-sectoral coordination to address them, magnify these challenges. Working with communities to collect gender-disaggregated and spatially disaggregated data over time and using mediators to reformat data into usable forms would help address the identified challenges. Additionally, working with the private sector was identified as a way to access better data and support for climate action;

(b) **Group two discussed integrating short- and long-term climate considerations into adaptation planning**. Challenges identified included: the mismatch between city-level public sector planning and infrastructure investment life cycles; planning conducted retroactively in response to private sector investments and activities; and lack of

[1] Further details available at http://www.unfccc.int/adaptation/nairobi_workprogramme/workshops_and_meetings/items/10447.php

[2] As footnote 1 above.

prioritization of long-term adaptation planning because of competing urgent short-term issues, such as disaster risk management. Poor access to good-quality and appropriately presented data as well as a lack of public finance that is accessible at the subnational level also limit the integration of short- and long-term planning. Several options were identified for addressing these challenges, including maintaining a long-term focus and using champions to help popularize and communicate issues. Citizens should be involved in identifying and prioritizing options, both to catalyse political action and to ensure popular support for the resultant climate-related regulations. Engaging the private sector in adaptation financing and strengthening the public sector, particularly in terms of interacting with the private sector, were seen as key ways to resolve timescale mismatches;

(c) **Group three discussed the role of national governments in supporting local-level adaptation**. It highlighted the varying local and national political cycles, underfunding of adaptation, competing development priorities, gender issues and lack of access to data as key challenges. Such challenges are being addressed through, for example, a metropolitan climate change department established in Egypt, national support for ecosystem-based adaptation approaches in Brazil, a national funding pool for adaptation initiatives in Hungary and a platform developed by the organization CARE that brings together data users and providers to resolve data usability issues;

(d) **Group four discussed city-to-city partnerships and networks for adaptation**. It identified a lack of South–South partnerships, insufficient human and financial capacity in local governments and poor interdepartmental sharing of information as key challenges to maintaining effective city-to-city partnerships. It discussed several existing examples to learn from, including currently successful city networks, North–South partnerships and city-to-university partnerships, such as the EPIC-Network.[3] It also identified ways to enhance city-to-city partnerships, such as developing toolboxes to support South–South partnerships, differentiating political and technical partnerships and ensuring partnerships are based on needs. Working with indigenous and local peoples within the framework of city-to-city partnerships would guarantee that traditional knowledge of natural resources conservation is taken into account.

5. The forum facilitator summarized the discussions and outcomes of the 11th Focal Point Forum before the SBSTA Rapporteur closed the forum on behalf of the SBSTA Chair.

[3] See http://www.epicn.org.

Annex III

List of the submissions on human settlements and adaptation

[English only]

Party/organization	*Link to submission*
Parties	
European Union, submitted by Estonia	EE-11-09-SBSTA3_EU Submission on NWP_HS_
Indonesia	Indonesia Submission - SBSTA44 ai 3c - NWP Human Settlement – 27102017
Thailand	Thailand_NWP_Sep2017
Vanuatu	Vanuatu_SBSTA Submission_Human settlements
Organizations and networks	
Action for Sustainable Development	Submission from ADS
Alliance for Global Water Adaptation	Submission from AGWA
Asia-Pacific Network for Global Change Research	Submission from APN
Basque Country, Spain	Submission from the Basque Country (Spain)
Boticario Foundation	Submission from the Boticario Group Foundation
Caribbean Natural Resources Institute	Submission from CANARI
Conseil Régionale de la Réunion	Submission from la Réunion
Food and Agriculture Organization of the United Nations	Submission from FAO
Global Development Network	Submission from the Global Development Network
Gobierno Provincial del Azuay, Ecuador	Submission from Azuay (Ecuador)
Government of South Australia	Submission from the Government of South Australia
Indian Institute for Human Settlements	Submission from the Indian Institute for Human Settlements
International Institute for Environment and Development	Submission from IIED
International Institute for Sustainable Development	Submission from IISD
ICLEI – Local Governments for Sustainability	Submission from ICLEI
RegionsAdapt	Submission from nrg4SD
Royal Melbourne Institute of Technology	Submission from RMIT part 1 and part 2
United Nations Human Settlements Programme	Submission from UN-Habitat
United Nations University Institute for Environment and Human Security	Submission from UNU-EHS
WayCarbon and Belo Horizonte, Brazil	Submission from WayCarbon and the municipality of Belo Horizonte, Brazil

Annex IV

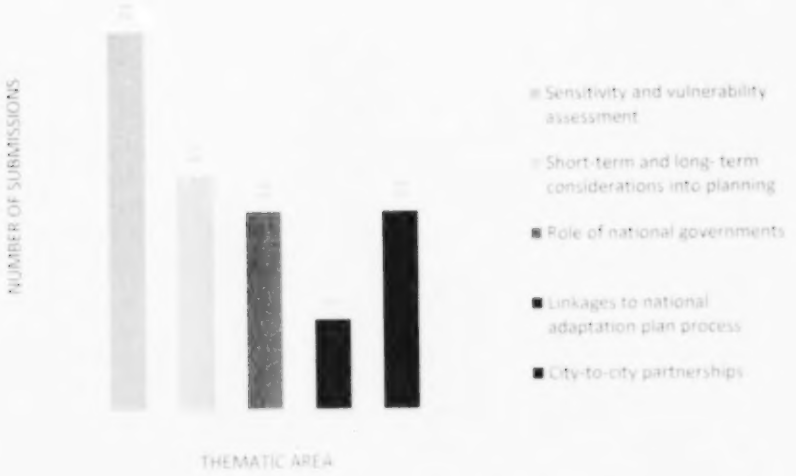
Overview of the submissions on human settlements and adaptation

[English only]

1. As at 27 October 2017, the 24 submissions received included 3 from Parties, 1 from a group of Parties, 4 from regional governments and 16 from organizations, including 13 partner organizations of the Nairobi work programme on impacts, vulnerability and adaptation to climate change (see annex III for a list of the submissions). The submissions covered the global down to the local scale, with 7 submissions adopting a global approach. The other 17 submissions contained experience and research from the following regions: Asia (5), South America (3), the Pacific/Oceania (3), Africa (3), Europe (2) and the Caribbean and Central America (1). Figure 1 shows the thematic focus of the content of the submissions. Figures 2 and 3 show the distribution of submission content by type of settlement and country, respectively.

2. A limited number of submissions explicitly presented approaches, tools or methods for adaptation planning in response to slow onset events.[1]

Figure 1
Distribution of submissions by thematic area



[1] According to decision 1/CP.16, slow onset events include sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, loss of biodiversity and desertification.

Figure 2
Distribution of submissions by type of settlement

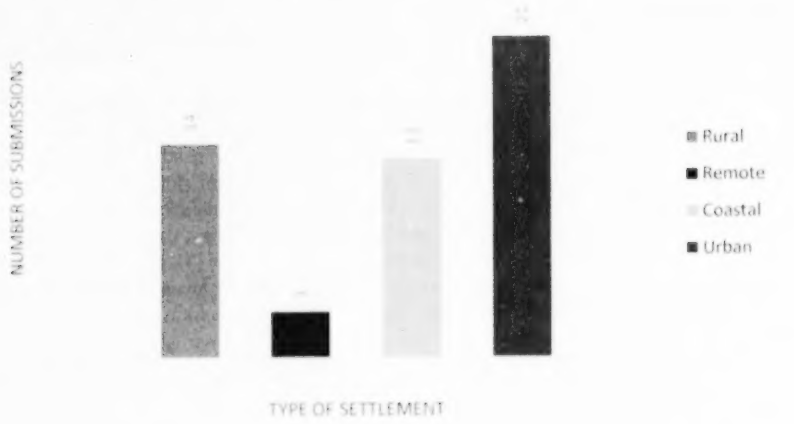
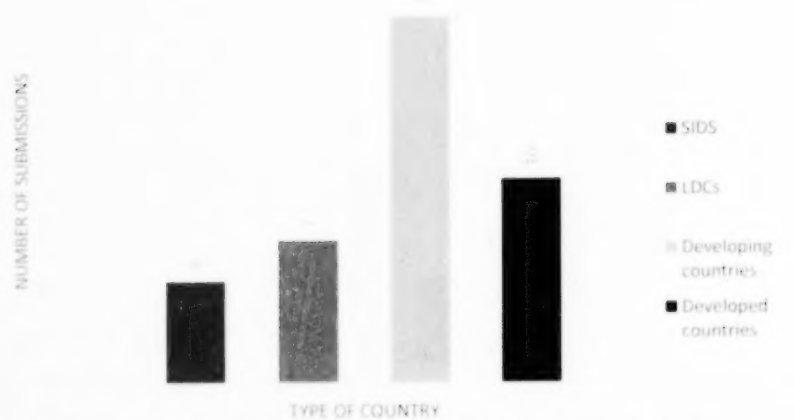


Figure 3
Distribution of submissions by type of country



Abbreviations: SIDS = small island developing States, LDCs = least developed countries

3. The submissions referred to a wealth of tools and methods, which are listed in annex V, as well as references to scientific papers, technical reports and policy briefs. Those knowledge resources are now easily accessible via the adaptation knowledge portal.[2]

[2] http://www4.unfccc.int/sites/NWP/Pages/Home.aspx and its advanced search page http://www4.unfccc.int/sites/NWP/Pages/Search.aspx

Annex V

List of tools identified in the submissions on human settlements and adaptation

[English only]

Organization	*Link to tool*
Alliance for Global Water Adaptation	Collaborative Risk Informed Decision Analysis (CRIDA)
Alliance for Global Water Adaptation	Eco-Engineering Decision Scaling (EEDS)
Asia-Pacific Network for Global Change Research	Community Resilience Tool
Asia-Pacific Network for Global Change Research	Community resilience assessment and climate change adaptation planning: a Cambodian guidebook
Asia-Pacific Network for Global Change Research	Community resilience assessment and climate change adaptation planning: a Vietnamese guidebook
Caribbean Natural Resources Institute	Needs assessment tool for capacity-building of community service organizations
Indian Institute for Human Settlements	Transformative Scenario Planning
Indian Institute for Human Settlements	Teaching and learning cases focusing on urban inclusion
Indian Institute for Human Settlements	Urban Fellowship Programme
International Institute for Sustainable Development	Vertical Integration in National Adaptation Plan (NAP) Processes: A guidance note for linking national and sub-national adaptation
ICLEI – Local Governments for Sustainability	ICLEI ACCCRN Process toolkit
ICLEI – Local Governments for Sustainability	Building Adaptive and Resilient Communities (BARC) tool
ICLEI – Local Governments for Sustainability	Resilient Africa Interactive Adaptation Participatory Process tool
ICLEI – Local Governments for Sustainability	PACMUN (Plan de Accion Climatica Municipal) framework
ICLEI – Local Governments for Sustainability	Local Government Climate Change Adaptation Toolkit
ICLEI – Local Governments for Sustainability	The carbonn® Climate Registry (cCR)
United Nations Human Settlements Programme	City Resilience Action Planning tool (CityRAP tool)
United Nations Human Settlements Programme	Planning for Climate Change Toolkit
United Nations Human Settlements Programme	Developing Local Climate Change Plans: a guide for cities in developing countries
	Cities and Climate Change Initiative
United Nations Human Settlements Programme	Pro-poor Urban Climate Resilience in Asia and the Pacific: quick guide for policy makers
United Nations Human Settlements Programme	Cities and Climate Change Academy: educational modules for the curricula of universities, higher education and training institutions on climate change in urban areas
United Nations Human Settlements Programme	A Tool for Coastal and Small Island State Water Utilities to Assess and Manage Climate Change Risk
United Nations Human Settlements Programme	Guiding Principles for City Climate Action Planning: Toolkit for city-level review
WayCarbon	Model for Vulnerability Evaluation (MOVE)

Annex VI

Relevant adaptation networks

[English only]

1. **The submissions reported on several global multi-stakeholder networks focusing specifically on cities and resilience to climate change impacts, including**:

(a) The United Nations Office for Disaster Risk Reduction campaign Making Cities Resilient: My City is Getting Ready,[1] which is a voluntary partnership and city-driven campaign that aims to raise awareness of resilience and disaster risk reduction among local governments and urban communities worldwide;

(b) Cities Alliance Joint Work Programme on Resilient Cities,[2] through which 20 partners and Cities Alliance members are working to facilitate the flow of knowledge and resources. This will enhance city resilience tools, approaches and capacity development interventions within long-term urban planning processes that also address informal settlements and the working urban poor;

(c) Medellin Collaboration for Urban Resilience,[3] which brings together key institutions in the field of human settlements to facilitate the flow of knowledge and financial resources necessary to help cities become more resilient to disruptions related to climate change. Disruptions include disasters caused by natural and human-induced hazards and other systemic shocks and stresses, such as socioeconomic challenges associated with rapid urbanization;

(d) Cities Climate Finance Leadership Alliance,[4] created in 2014, which is a multi-stakeholder and multilevel coalition of networks of cities and regions, private investor coalitions, development banks, central governments, research centres, foundations and civil society organizations.[5] They have come together to propose a set of measures designed to catalyse and accelerate investment in low-carbon and climate-resilient infrastructure in urban areas;

(e) Recycling the City Network (RECNET), which is a multi-stakeholder network launched at the 7th World Urban Forum, in Medellin, Colombia, in 2014, now counting over 60 partner organizations in 27 countries. RECNET is coordinating the International Program on Urban Resilience (RESURBE) aimed at facilitating knowledge co-creation and exchange between local and regional governments, universities and research centres, international organizations, grass-roots movements and other stakeholders. RESURBE promotes research, capacity-building and urban resilience projects worldwide and supports informed policymaking on urban resilience and climate change adaptation and mitigation.

2. **Networks on specific sectors** (e.g. water or food security) can also provide relevant support for adaptation, including:

(a) The United Nations Human Settlements Programme Global Water Operators Partnership Alliance, which promotes, guides and facilitates peer support partnerships between water utilities in different cities. A total of 30 partnerships have been formalized to date and provide partners with practical knowledge and support as they develop their adaptation approaches. In the Philippines, the partnerships have supported water utilities in moving from a low level of awareness to assessment and adaptation planning in under three years;

[1] See https://www.unisdr.org/campaign/resilientcities.
[2] See http://www.citiesalliance.org/JWP-Resilient_Cities.
[3] See http://www.iclei.org/details/article/medellin-collaboration-for-urban-resilience-commits-to-supporting-4000-cities-and-2-billion-annual.html.
[4] See http://www.citiesclimatefinance.org.
[5] The full list of members is available at http://www.citiesclimatefinance.org/about/members.

(b) The Food and Agriculture Organization of the United Nations Milan Urban Food Policy Pact, to which 150 cities have formally committed. It contributes to raising awareness and capacity, and equips cities and their surrounding regions to develop sustainable and climate-smart food systems in two ways: by fostering dialogue and experience-sharing as a source of innovation for effective food solutions and adaptation to climate change (particularly among southern cities); and by sparking innovative action to strengthen food systems and improve their resilience to climate change;

(c) The CITYFOOD network,[6] which aims to accelerate local and regional government action on sustainable and resilient city–region food systems by combining networking with training, policy guidance and technical expertise for its participants. It is open to both local and regional governments, whether they are engaging in this issue for the first time or are at the frontier of innovative work on food systems;

(d) GenderCC – Women for Climate Justice, a global network of women's organizations and gender experts, which is currently developing and testing a method for gender assessment of urban institutional settings and climate change action programmes with the aim of better addressing the cross-cutting issues of climate change and gender and identifying priorities for gender-responsive urban climate policy. Cities, their networks and community-based organizations are invited to utilize the method, which will be made available in 2018, and share their experience on the GenderCC global learning platform.[7]

3. Networks for **governments situated between the local and national level** include RegionsAdapt,[8] which is a framework for such subnational governments to take action, collaborate and report efforts on climate change adaptation. Among its seven priority areas, RegionsAdapt addresses resilience and disaster risk reduction; infrastructure and territorial planning; and social impacts and adaptation.

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[6] See http://www.iclei.org/index.php?id=1348.

[7] Available at http://comm.gendercc.net.

[8] See http://www.nrg4sd.org/climate-change/regionsadapt.